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The sea base

[Duluth?]

[1923]

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The Sea Base

RELATION OF MARINE TO NATIONAL TRANSPORTATION SYSTEM AND OF LAKES-TO-OCEAN ROUTE TO CONTINENTAL TRAFFIC

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GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

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RELATION OF MARINE TO NATIONAL TRANSPORTATION SYSTEM AND OF LAKES-TO-OCEAN ROUTE TO CONTINENTAL TRAFFIC

GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

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The Sea Base

By various agencies the transportation system of the United States is under scrutiny, compelled by conditions which are fundamentally unsound. Rates are exposed to stringent challenge; finances of many important systems are severely strained; physical facilities have been improved, but in some important respects are still notoriously inadequate. Within recent years motor transport has assumed proportions comparable with railway traffic itself, railroad rates have been advanced by sixty per cent or more, Panama traffic has completely altered the transportation map, tonnage has increased out of all proportion to plant extension, regulation has altered materially the status of operating companies and officers, line haul has been subordinated to terminal costs, proposals are under consideration for redistributing corporate ownership on a continental scale—every popular or economic concept of railway duty and transportation service has been profoundly modified.

In relation to this congeries of problems, we propose to discuss the place of the Sea Base in the continental system of transportation. It is, of course, true that no one phase of this problem can be segregated from all the other elements that enter into it. They can no more be separated than color from texture, anatomy from physiology, spirit from flesh. The relation of the Sea Base to continental transportation, presents, however, certain distinct phases of the problem which, in view of these new conditions, require fresh consideration.

GREAT LAKES–ST. LAWRENCE TIDEWATER ASSOCIATION
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I

The concept of a national transportation system is comparatively new. The fact is in the future; there is no such system in being. Existing transportation agencies are the product of historical and economic accident. The traffic paths have been marked out by the pressure of conflicting interests. The rate structure has been assembled bit by bit without pattern and without design. The physical plant has grown without continental plan.

Railroads began at the Atlantic seaboard and worked west to the Ohio valley, through the corn belt, across the plains, over the mountains, to the Pacific coast. Individual lines were made the subject of calculation, individual systems were planned, but the creators of our present transportation facilities worked without thought of national plan. The one force was the determination of each of the great railroad builders to push his own lines as far as he could, to extend his own territory to the utmost limit.

The rate structure, such as it is, likewise the product of fortuitous purposes, was still less a subject of design. It is the haphazard product of conflicting interests, abounding in contradictions and inconsistencies. It was made by a process of pulling and hauling, of struggle for business between one railroad and another, between one distributing center and another, between one factory and another, between one market and another. The result is endless conflict, bordering on chaos.

In the nature of things, something like consistency has been achieved and the pressure of state and federal commissions has been exerted in the direction of uniformity and systematization. The hodge-podge of rates is qualified by the necessity of following rules established by precedent, though in many cases the conflict of tendencies has not been even approximately solved. Further progress is almost forbidden unless some broad principles can be established. Perhaps the time has come when a bold departure ought to be made, to correlate the rate structure with the physical facts as well as the several parts of the physical structure with one another.

Thus far the rate structure of transportation service has been reached by empirical methods. No rate-making body ever did, and no rate-making body ever could begin with adopting a system of principles and proceed by adjusting specific rates to those principles. It came about in the other way. To reach an adjustment of the present difficulties that will give even approximate satisfaction, some broad principles

must be understood, at least as a basis for adjustment. The adoption of such principles must be accomplished by examination of the facts, which, so far as I know, has never been made on broad lines and by the exercise, at least to some extent, of *a priori* reasoning, which is rather despised by railroad executives and traffic men and which I think is disdained by the rate-making bodies.

It is true that rate-making has had the benefit of certain tendencies, which, standing in the place of principles, may be reconciled, after a fashion, by rule of thumb methods. The first and simplest is the distance tariff. It is complicated by terminal costs and can be fairly applied, to such extent as it ought to be applied, only when a fair allocation is made of terminal costs and line haul. For such allocation it is recognized that a radical revision must be made of the proportions hitherto adopted by custom and tradition. The opposing rule is that of charging what the traffic will bear. The soundness of this rule, within limits, is conceded. The question must be carefully examined whether that rule has not been pushed beyond its logical application to a point where the struggle for long-range traffic has placed undue burden on normal traffic—commerce within the logical radius of rail haul. The legitimate rule of charging what the traffic will bear and the praiseworthy effort to give every section the largest possible use of inadequate outlets, has brought about distortion of the rate structure. The attempt to give every railway a chance at any possible business has at times been carried to such lengths that railroads were largely occupied in hauling freight around two sides of a triangle, when the more economical way would be to send it across the hypothenuse.

The governing rule in rate-making has been that of equalizing competition—the competition of carriers, the competition of commodity sections, the competition of outlets, the competition of distributing centers, the competition of markets. The competition of carriers resulted in pooling arrangements, differential agreements, long-haul concessions, and the like. Pooling has been outlawed, differential rates have fallen into disrepute, but the heritage of thirty years of rate-making on that basis is the chaos and confusion with which shippers, railroads and public tribunals are now struggling. The rule of charging what the traffic will bear was for a long time applied with laudable intent and with beneficial results to the deep interior. Indeed, the extent to which that rule had been pushed is made evident by the adverse effects upon production when rates were necessarily revised from the standpoint of the carriers' need of revenue. Many products from the further points of origin have been ruled out from market by the recent rate advances. The resulting dilemna is the alternative of throwing the deep interior back upon its own resources or returning

to a system of heavy concessions—unless facilities can be provided which will give more economical routings.

Akin to the competition of carriers is the competition of outlets, evidenced in the long-continued struggle between the Atlantic ports among themselves, and then between the Atlantic ports and the Gulf ports, springing up now in a rivalry between continental service and the outlet of the Pacific ports. In these contests the gateway cities take a principal part and the railways serving them are in constantly changing alliance either to gain advantage or to maintain minima. The competition of distributing centers is usually a local affair, but in the attempt to adjust distributing rates it frequently appears that some change of minor import threatens to disrupt the structure of freight rates for the entire region.

There are unsettled problems of the relation of highway transport to railways and of water competition to rail. Curiously enough, the coordination of railway and highway, although the whole problem has come up within the last ten years, seems nearer adjustment than the others. Perhaps it is because the difference in function is more easily recognized, the economy of highway transportation as compared with railway can be measured with better approximation. The motor does not threaten to take from the railways any traffic that they want on any large scale, but rather it creates new traffic, gathering it up for the railways more economically than they could furnish equivalent facilities, certainly with much less cost than they could build a net-work of lines ten miles apart for accumulation of wagon-loads, while in those transportation services where terminal cost is the principal element, the transfer of traffic from rails to highway is often a matter of relief rather than apprehension to the railway companies.

There are fields of competition between railways and waterways which must be reconciled and for which some formula must be found, but over a wide range they are not in competition. The railroads do not offer to compete with the ore movement from Lake Superior to Lake Erie, or the coal movement from Lake Erie to Lake Superior. It is recognized that in such cases the more economical agency for a particular movement will occupy the field which must be surrendered by rival carriers. Perhaps if the function of each arm of transportation were clearly perceived and definitely described, all these difficulties would be solved or would be as near solution as the relation of highway transport to railway.

The outstanding fact is that in this process of adjustment by distortion, partially counteracted by the efforts of ratemaking bodies to maintain uniformity of practice, there is not sufficient protection anywhere for the economic interests of the whole. There is no body of

principles by which the economic interests of the whole may be interpreted. Inter-relation of rates by rail and river is confused. Relation of local to trans-continental rates is chaotic. The interests of the deep interior are impaired if not sacrificed.

The absurd conclusion is reached that carriers cannot be made self sustaining, except upon a basis of rates which is economically and politically impossible, and that the resources of the deep interior cannot be developed except upon terms which would bankrupt the carriers. When there is before us an absurd conclusion, we are bound to believe that the grounds upon which it was reached were not correctly formed.

II

The Panama Route has not only changed the transportation map of the United States, but it has introduced a new set of conditions which require a re-examination of the entire transportation structure of the country, a broad readjustment of basic rules, and which impose upon us the necessity of finding a set of principles by which to test the correctness of individual decisions. Rule of thumb methods won't cover a continent.

During the last two years Panama traffic has more than doubled; most of the increase has been in traffic between the East Coast and the West Coast of the United States. New markets have been opened to New England manufacturers; commodities from the Pacific Slope have been received upon the New England seaboard in unexpected volume. The competitive situation has been so altered that manufacturers in the Middle West have been shut out completely from markets to which they formerly had access. The transcontinental roads—that is, from Chicago to the Pacific, two-thirds of the way across—recently applied for permission to cut rates on certain commodities fifty per cent or more. Shippers and consumers in the intermediate country are unwilling, perhaps resentful, to see factory products go hundreds of miles beyond them for lower rates than they can command.

For example, the rate on certain steel products from Pittsburgh to the Atlantic seaboard is thirty-five cents, from Atlantic ports to the Pacific, forty cents—seventy-five cents from Pittsburgh to San Francisco by rail and ocean. The all-rail tariff of $1.50 from Pittsburgh to the Pacific becomes a paper rate only. The railroads have resigned that traffic. But from Chicago to the Pacific the rate is $1.35. Chicago, shut out from the Pacific Coast, asks for reduced rates, and the railways, desiring the benefit of west-bound traffic where the principal volume is east-bound, are more than willing to agree; but the problem of the rate-making bodies is not so easily solved. A reduction of fifty per cent for this through movement, while farmers dependent on the service of these railroads are vainly urging similar reductions in order to put them on a parity with their competitors in the markets where their surplus is sold, involves complications. Whatever decision is finally reached in this particular matter, we are directed to a problem of major importance. A series of questions rises to which empirical method of making rates gives no adequate answer. A series of conditions supervenes which cannot be reconciled. The railroads must make a living.

No general reduction in rates is possible. The manufacturers of Chicago and the Middle West are entitled to access to market. The farmers of the corn belt are likewise entitled to access to market. The people of the deep interior are entitled to enjoy the best possible rates without discrimination. A set of problems is introduced to which empiricism furnishes no solution and questions are raised which cannot be justly answered until the functions of the railway are defined and the national system of transportation is understood in terms of concepts that have not hitherto been developed.

A striking feature of this Panama situation is that while it has disturbed conditions over the entire continental area, or at least two-thirds of the way across the continent, and has injected into the rate situation an insoluble problem, the tonnage directly involved is relatively small. During the calendar year 1924, the traffic between the East and West Coasts of the United States via Panama was upwards of ten million tons; eastbound, seven million, eight hundred thousand, westbound, two million, two hundred thousand. But of the eastbound movement more than five million tons was not only special cargo, but cargo in special carriers—that is, oil in tankers. The eastbound movement of general cargo was two million, five hundred thousand tons. Compared with 1,300,000,000 tons carried by the railways of the United States, the figures seem trivial. It is not the volume of traffic that determines its importance in all respects; there are strategic weights and values. Adjustments which determine the course of trade, the trend of traffic and the development of wide sections of the country, may be founded upon movements relatively small and apparently inconsequential. The traffic of Panama, the new factors it has introduced, the disturbance of the continental rate structure, the creation of new markets and the closing of former traffic paths, constitute some of the new phenomena that direct our attention to the transportation system in general and particularly to the relation of the Sea Base to the national system.

III

In the present transportation system the railways are the dominating arm. They cover the country with a network. In all occupied territory the network touches every point; and where the railways have not gone there is no occupation. We think of the transportation system as though it consisted of railways with a fringe of motor transport, an irritant of water carriage, and occasional interference by marine. Thinking of this national system as synonymous with railway transportation, attention has been directed to the railway problem as though it were the entire transportation problem, with the consequence that the larger problem has not even been approached. Much of our present confusion is due to the fortuitous growth of transportation lines and traffic paths, while the disability of the carriers may in large degree be laid to the fact that functions were not analyzed and systems were not planned with reference to economy of function. It is axiomatic that as and when the movement of commodities is conducted along the most economical lines, the prosperity of the country and the prosperity of the several agencies of transportation will be best served. It is axiomatic that the best economy of each arm of transportation is attained when it handles the traffic for which it is best adapted and upon which it can most effectively function.

Now for thirty years the railway apparatus of the United States has been the subject of criticism, whether well founded or not, in respect to rates, in respect to service, in respect to transportation policy, in respect to sufficiency of equipment, in respect to sufficiency of plant, and at various times in the last fifteen years the sober judgment of responsible bodies has been expressed that railway facilities were inadequate. For example, when President Roosevelt transmitted to Congress the report of the Inland Waterways Commission in 1908, it was pointed out that the railways in the preceding season had been unable to handle with reasonable promptness the crops of the preceding year. The language was then used that railroad facilities had not kept pace with the growth of traffic. In various official reports made since then similar conclusions are presented with increasing distinctness, accompanied by a description of a situation of more and more pressing urgency.

During the last year or so, the situation has been improved, due more to a forced speeding up of the transportation machine, than to permanent betterments.

Explanations for particular failures have been made which were more or less convincing—strikes; or stress of weather; or overregulation; or hampering of financial ability; or shortage of equipment; or lack of terminal facilities—and due weight must be given to each of these explanations—but when a machine cramps and clogs as often as it is overloaded, when there is insufficient reserve margin for the peak load which comes every year, when the necessary provision of adequate terminals entails expenditures greater than the promise of increased revenue, we are warned not to look to some device or other, but to examine the structure.

Overregulation, however severe its restrictions may be, does not account for the disabilities of the railroads. When the Roosevelt Commission in 1908, pronounced the railway system of that day inadequate to handle the country's traffic, railway regulation was in its incipiency. Legislation giving the Interstate Commerce Commission command over rates had not then been passed. The regulations of 1908 would hardly be recognized as restrictions by a railway executive operating under today's conditions. So that, however vexatious regulation may have become, the inadequacy of our transportation system is not accounted for on that score. From the earliest days down to 1885, there was a rapid decline in railway rates; from 1885 to 1895, a slow decline; from 1895 to 1915, the ton-mile rate showed a slight variation, and that upwards. It may be that regulation hampered the opportunities of the railways, but ton-mile earnings as the product of railway rates were held steady during the period of regulation. Then came the time when all rates and values had to be restated and in a series of sharp advances railway rates were approximately doubled. They are now, after readjustment, about sixty per cent above the 1915 levels. Yet we are solemnly warned that some of the railways are facing disastrous conditions unless relief is given. That situation, when heavy rate increases do not provide sufficient revenue, directs our attention to the structure of the transportation system, rather than to functional disturbance.

Traffic is increasing enormously; with the volume of business steadily increasing and the future volume absolutely assured, the railways can with difficulty finance the purchase of equipment necessary to handle the business that is pressing upon them. Such a profound dislocation of the natural relation between service and compensation directs our attention not to functional disturbance, but to the very structure of the transportation system.

For at least fifteen years the need of railway improvements both in fixed plant and equipment has been stated in terms of billions. The last year has seen a marked improvement in the car supply, due to the

persistent efforts of the American Railway Association, in securing more efficient loading and more expeditious release of equipment. A large number of locomotives and freight cars has been purchased, mainly from equipment notes, the interest on which must be paid and the principal amortized from the freight receipts—a further obstruction to lower rates. The betterments have been largely confined to new equipment; there have been few extensions of lines, and the terminals are notoriously obsolete and inadequate. At no time in the last fifteen years has it been possible for railway management to command the means for meeting all these needs. During that time another arm of transportation has expanded from nothing to a ten billion dollar proposition. The country has found ten billions to spend on automobile plants within that period. Simultaneously there has been spent on free right of way for automobiles from public funds an additional two billions. The criticism has been made, and its force is recognized, that the railways, already overburdened, have been compelled to pay taxes to help build the highways which were turned over free of charge to the automobiles. The validity of that criticism is disputed in some places, but it is not necessary for the present purpose to go further into that. The pertinent point is this: that where taxes have been laid upon automobile traffic, designed to cover capital charges and maintenance cost of the highways also, they have been readily met, and in some cases they have been voluntarily proposed. That is to say, automobile transportation has found funds for plant construction, for equipment, for operating expenses, and, whenever it has been called upon to do so, for construction and maintenance of way, at a time when railway transportation has found it impossible to finance itself adequately. It has done this during the period when the automobile was an experiment, its operation wasteful, its economy as an instrument of transportation a wild guess. This set of facts again invites our attention to structural causes rather than to functional disturbances as the real source of the disability of the railroads.

Remedial treatment for the disabilities of the railway system, or of the transportation system in which the railways are necessarily the predominant factor, is, we have seen, not a matter of administering a tonic or plastering a sore. It goes into the very structure of the transportation system. It deals with fundamental economies. The importance of operating economy and of the gains which may be made in that direction is not to be underestimated. The calculation that an increase of ten per cent in average car loading or an increase of ten per cent in daily car mileage is equivalent to two hundred fifty thousand cars, demands the very respectful attention which it is receiving at the hands of railway associations and railway operating chiefs. The

possibility of increasing the effectiveness of the railway machine along those lines deserves all the emphasis that has been given to it. But even in the exercise of this economy in operation, our attention is frequently directed to the fact that the disability of the railways comes from structural causes rather than from functional disturbances.

Especially does performance measured by car mileage point in that direction. Total car mileage is not increased by cracking a whip over locomotive engineers and firemen. It is a resultant of many factors in which the energy of the man at the throttle is the very least. Among those factors, the hauling power of the locomotive is seldom significant. Terminal capacity has much more to do with it. Clearance at terminal is half the battle. Congestion at terminals more than any other factor kills car movement. To relieve terminal congestion the remedy is sometimes found in applying the lash, finding an operating chief who will manage to do what other men could not get done. But where terminal congestion frequently appears it is a matter of course that the remedy is structural and not improvement in operating practice. A yard may be cleared once or twice by putting on more steam, but a proposition to carry through the yard constantly more traffic than can be accommodated in a steady flow, would be a commercial absurdity and an economic sin. The belt line is the natural resort to avoid congestion in dense traffic areas. As for the embargo, that is not in any sense a remedy. It may be confession and avoidance, but no cure.

But there is another factor which kills car mileage and which rivals in significance that of terminal congestion and sometimes exceeds it. That is the problem of the Car Service Division of the American Railway Association—the problem of placing cars where they are needed. And for the permanent solution of that problem, our attention is directed to structural disability rather than to functional disturbance. Every fall the western lines lose about half their box cars. This is not because they are commandeered by eastern lines. The box cars are lost to the west because there is no way of returning them over a distance of a thousand miles or more to the base line of western operation. It would be physically possible, though it would not be financially feasible, to provide enough cars so that there would always be a supply on western lines during the season of crop movement. It would mean the provision of such a supply that a very large proportion of the car fleet would be required to make but one round trip per year—an economic absurdity upon the face of it. Our attention is therefore forcefully directed to the study of structural causes rather than functional disturbances in our transportation system.

Terminal congestion is a symptom; car shortage is a symptom. The embargo is the symptom of a symptom. Operating practice can

achieve much, but experience shows us that in times of pressure upon the transportation system we are unable to employ existing facilities for all they are worth. The more business increases the less work can be got from a given facility. The higher the pressure upon a terminal, the less business can be put through that terminal. The greater the demand for box cars, the less mileage can be delivered. Our attention is driven to the fact that every functional failure is either due to structural fault, or aggravated by it. At the bottom of all our troubles is the malformation or deformity of the transportation system.

IV

Ocean transportation in its relation to railways is on a distinctly different footing from the competition or co-ordination of inland waterway service. Normally, goods for export are laid down at the water's edge where their movement across the water depends upon the ocean rate and the price in the ultimate market, or else they are sold in the foreign market regardless of transportation costs. Freight competition, for example, is not a factor in the export of typewriters. Wheat, on the other hand, is or is not on an export basis, according to market conditions, including the market for charters. That is, the foreign trade movement is not normally conditioned upon domestic freight rates. The water's edge is the natural breaking point. Internal rates are not made with reference to external movement. It is true, there are special export rates but these are confined to the main stem and do not ramify through all the threads and filaments of traffic. The export rate on wheat is made from an inland terminal to the seaboard, not from the loading station. There is an essential difference between rate adjustment to facilitate foreign trade and that internal rate fabric in which results are reached by pulling and hauling, by setting up and reconciling conflicts of interest which penetrate the entire network. So far as there is adjustment of inland rates for the benefit of ocean commerce, it is on broad lines. It is the product of competition between gateways, the competition between producing sections.

On broad lines, if there is competition between gateways, it may be between Boston and New York or Philadelphia and Baltimore in the same range of ports; it may be between the outlets of the Atlantic seaboard, the Gulf or the Pacific, from a given territory. If there is competition between producing sections, it may be between Northwestern and Southern wheat fields, or it may be between North America, India and Argentina. Competition is on wide limits and its adjustments are applied to the main stem and not directly to all the rills and rivulets of traffic.

Rivalry between ports and competition between lines reaching these ports has brought about a series of historic struggles, complicated sometimes by rate wars of the ocean lines. For more than a generation there has been a recognized differential between Boston and New York on the one hand, Baltimore and Philadelphia on the other. That differential, reached after a long struggle, was an effort to equalize through rates. It was agreed that the rail rate to Philadelphia and Baltimore should be

a little less than to New York, and that Boston should have the same rate as New York. The historic reasons for that differential have vanished. Ocean rates are no longer a distance tariff; the economic differential is one of terminal costs. But though there has been dissatisfaction with the settlement for many years, it has been found as difficult to upset it as it was to establish it. That very fact—that an arbitrary situation is perpetuated in the face of continuing dissatisfaction—agrees with the statement that ocean traffic is independent of internal rate structure, and that adjustment of inland rates to the foreign movement has not the same essential relation to function that the adjustment of inland rates has to domestic traffic. Perhaps that is still more apparent in the inbound movement. The movement of traffic originating beyond the port has its effect, of course, upon inland rates, but only a blunted effect. For example, a manufacturer of Ohio, wishing to meet on equal terms in a certain territory a manufacturer in Illinois, will apply for specific changes in the railroad tariff to designated points. There is nothing like that in the distribution of ocean-borne freight. Whatever effect it may have upon rates, it follows the paths worn by other traffic.

As marine traffic plays little part in the shaping of internal rate structure, so there is little control over ocean rates by rate-making authorities. In the case of foreign bottoms there is no direct control and the sphere of indirect influence is quite limited. Any control over rates ceases at the water's edge. Joint rates, through rates, participating rates, proportional rates, and all the terms of control associated with inland rate-making, either have no meaning or a very different meaning when goods are in movement to or from foreign destination.

Still broader than the competition of ports is the competition of sea coasts. As there was a struggle between the Atlantic ports, so there was contention between the Atlantic ports and the Gulf in which it was set up either that there were discriminations against the Gulf ports or that equality of opportunity was denied them. From that long-drawn-out contest a series of settlements was worked out, designed to give substantially equal opportunities to all ports to develop traffic with the interior.

The opening of the Panama route introduced new elements. Until then, the influence of the Pacific ports had been local and the effect of ocean navigation on continental traffic had been limited. Within the last few years the Panama route between the Pacific and Atlantic seaboard has become not only the controlling route, but the prevailing route, for many kinds of traffic. Rail rates to or from the interior may facilitate or discourage ocean movement, but they do not determine shipment by car instead of vessel, or by vessel instead of car. It is

not the competition of one vehicle with another. In the movement between New England and Puget Sound, it is likewise true that there is little competition between the railway and the waterway. Silk, perhaps, will still be carried from Seattle to New York in solid train loads, a movement which illustrates the functioning of waterway and railway. It is the forwarding of a commodity which can bear express rates for expedited movement. But except for movement of high class freight the railway cannot function in competition with marine transport between the extremes of the continent.

Right there is the essential feature of marine transportation, not that it is foreign commerce but that it is continental as distinguished from local traffic. Marine transportation is the movement of commodities between one continent and another or between the remote arms of the same continent. The sea base for marine commerce is a natural development: the erection of highways and later of railways running to the sea base came about in the natural course of things. The tendency to the demarcation of what has been aptly described as "economic divides" is likewise a natural outcome. There is a well-defined but not exactly limited area constituting the Atlantic Seaboard. There is a well-defined though not exactly limited area constituting Gulf territory. There is a well-defined though not exactly limited area constituting the Pacific Slope. With whatever overlap or twilight zones, the terms are fairly well understood and represent pretty distinct economic facts.

There are two elements of confusion which it is hardly possible to overemphasize. One is the disturbing factor of what is called the trans-continental situation. The other is the existence in the heart of the continent of a large area beyond the radius of logical rail haul for the movement of bulk commodities to either sea coast. The trans-continental situation in brief is this: That the railways between Chicago and the Pacific Coast desire to retain a part of that traffic from which they are excluded now by the movement from the Atlantic Seaboard, especially in view of the fact that they need westbound tonnage for a balanced movement. That is, between the remote arms of the continent, marine transportation commands the field and the railway service consists in the short haul to the water base at either end; but there is a point at which the railway movement may be the shorter arc of a long elliptical curve, and at that point competitive factors appear with explosive effect in the rate structure. The other element is the existence of a large landlocked area, a circumstance under which manufacturers in the region of the Great Lakes are excluded by Panama competition from markets on the Pacific Slope to which they formerly had access; so these manufacturers become allies of the railways in seeking rate reductions

across the face of the continental fabric—and there is a riddle reserved for later reading.

Whether we are considering outgoing traffic or inbound traffic, the relation of rail service to water service in overseas business is clearly distinguished from the constant and intimate process of rate adjustment in internal transportation from the producer to the market, or from the market to the consumer. Control differs in kind, and in degree, and in mode, and in extent, and in application.

V

A national system of transportation is necessary, if chaos is to be resolved into order, if the railways are to be nourished so that they can maintain themselves and extend their occupation into areas still vacant, so that continuous service to the shipper may not be interrupted and so that the latent productive powers of all parts of the country may be developed.

The principal requirements in a national transportation system may be set down in simple terms. It must be capable of extending its service to every part of the country which has need of transportation; it must be capable of providing adequate service; it must be so fashioned as to promote economy; it must permit access to market for every producer and every consumer by the most direct route obtainable and by the most efficient means which the available resources can command and which the potential traffic will sustain. In this respect the needs of the country to be served and the interests of the carriers which furnish the service exactly coincide. They want service that will reach everywhere so that all opportunities for the creation of traffic may be put into play. They want an adequate and unfailing service so that production may be maintained. They want the facilities which will yield the maximum ultimate economy from which is derived the lowest cost to the shipper and the largest profit to the carrier.

Nature has marked out the basis of such a system. There is the well-defined though not exactly limited area of the Atlantic seaboard, there is the well-defined though not exactly limited area of the Gulf ports, there is the well-defined though not exactly limited area of the Pacific slope. The foundation of the transportation system is the sea base. The great channels are those which lead to ocean ports. The broad traffic areas are those from which commerce flows to the sea. The defining rates are those based upon marine transportation. The flow of traffic is in certain phases regulated by the sea base. It is the uneven flow of traffic to the sea base which at times upsets the entire transportation system; it is "potential water competition" which bedevils inland rates.

It is true that our export tonnage is but a small fraction of the whole. Fifty million tons exports as compared with one billion three hundred million tons or more of internal traffic—less than four per cent of the whole. But in the case of Panama movement, a quantum of three to five million tons was enough to make over the traffic map of the United

States, enough to open and close continental markets, enough to disturb and perhaps to upset the continental rate structure. Furthermore, it is this unbalanced movement to the seaboard which superposes an additional peak on the seasonal peak load, and even beyond that it is the freight coming down the Great Lakes in the fall which caps the peak load at the point of highest pressure. The least addition to the load over and above the margin of safety where there is no margin, is fatal.

We have seen that at a time when equipment is most needed we can get the least use from it. We have seen that the railways cannot comfortably finance the purchase of equipment necessary for handling the growing business put upon them and assured for the future. We have seen that transportation conditions require economy of every sort, not only such operating devices as increased car loading or quickening the turn-around, but radical economy in the use of the railway plant—cars, terminals and lines. Economy in employment of the transportation plant involves proper distribution of traffic through the most convenient terminals, disposal of the traffic to avoid terminal congestion, economy in the creation of terminal facilities, routing what will employ cars and motive power economically, delivery at base points which will permit not only quick turn-around at the terminal, but quick return to the original base. The most superficial view of the situation points conclusively to a study of internal transportation with reference to the sea base, a study of the radius of influence of the several ocean gateways, of adjustment of physical facilities and of rate structure to bring about the most economical use of each coast, and the adaptation of the existing plant with or without reconstruction to accomplish the movement of products from the interior to the seaboard or from the port of entry to the port of consumption with the minimum of economic cost.

Nature, which has indicated the extent of the area which sends its surplus to the Atlantic seaboard and to the Gulf and to the Pacific ports, has provided the American continent with one potential seacoast not yet utilized. Upon the map of economic divides indicated by the geography—the Atlantic seaboard, the Gulf territory and the Pacific slope—there is, as it were, an economic desert, an area a thousand miles east and west, five hundred miles north and south, beyond the radius of logical rail haul to either coast.

This region is, in fact, anything but an economic desert. The region of the Great Lakes and of the Upper Mississippi Valley includes large and prosperous communities, it commands a landlocked commerce of enormous proportions, it comprises the greatest producing sections of agricultural staples except cotton, and it is becoming the seat of large-scale industries. In the development of this region the commerce of the Great Lakes has been one of the controlling factors thus far. The

ability to ship ores, coal and bulk products of agriculture like wheat a thousand miles by water, has furnished the key by which these resources were unlocked and by which the territory was occupied.

Trace upon the map of the United States the fourth economic divide, based upon the Great Lakes as linked with the ocean, giving to the coast of the Great Lakes access to marine commerce, and a new symmetry appears. Every producing section of the country will then lie within logical rail haul of the water base. The conditions will then have been created on which it will be possible, without any extensive reconstruction of existing facilities, to erect each rail system upon the sea base. Economical distribution of terminal facilities will then be possible. The terminals of the lake ports, according to the display of enterprise in each case, will supplement and balance the service of the Atlantic ports and of the Gulf and of the Pacific slope. Railway rates can then be erected upon the water base with the least disturbance of the internal structure. Economy in the use of the railway plant will appear, not only in simplified routing, but in that command over the equipment by which cars dispatched to a lake port may be promptly returned to the loading station for continuous movement. Railway rates will be beneficiated so that railway finance will no longer be an impossible problem. The rate which is too high to let products move from Eastern Montana or Nebraska to the Atlantic seaboard, and too low to recompense the railways for that service, will give ample margin for reduction when the haul is made to the nearest lake port, and upon that reduced scale the rate will be not only ample recompense to the railway for the service, but will provide such nourishment that the railway may equip itself for its duty and even extend its lines into unoccupied territory. By every test condition—rates, service, financial ability, control of car movement and dispatch—the railways in the territory served by the lakes will be put upon their feet when they stand upon the sea base.

Under present conditions the trans-continental situation presents an impossible dilemna. Railways west of Chicago desire to cut their rates in half in order that manufacturers between the Great Lakes and the Missouri River may participate in the markets of the West Coast. Farmers in the same section demand rate reductions which the railroads declare would be ruinous, fatal. That set of problems will be greatly simplified, if it does not entirely disappear, when from every producing section the opportunity is given to reach the water base by a haul not greater than the logical radius of rail carriage, and the opportunity will be given to the railways to make a living in accordance with the resources of the territory they occupy from the internal movement to market and from market to the consumer within that territory, plus the

carriage of surplus products to the water base for low cost transportation to other markets.

Experience in the use of the Panama route furnishes illustrations both of the developing utility and the remaining infirmity of the national system. There has been communication between California and the Atlantic seaboard since the first vessel rounded the Horn. There were primitive traffic facilities in the days of the overland trail and the pony express. Time came when the overland trail was superseded by the Pacific railways and the trip around the Horn was obviated by the Panama railway. And the later time came when the need of communication between the two coasts was met by the Panama Canal. An investment of $463,000,000 was justified in order that there might be unbroken water connections between coast and coast. Though there was always an open seaway between the Atlantic seaboard and the Pacific coast, the conditions were not satisfied until there had been provided the best possible communication between the eastern and western littorals.

The deep interior could not progress beyond the facilities of the burro or ox team and the canoe and the flat boat until its local transportation was articulated with the economy of the railway. The progress of the deep interior is now likewise denied until railway carriage is articulated with the economy of marine transportation for the continental movement. No system of highways could be created that would afford the means of efficient motor transportation unless it were based upon railways giving access to markets beyond range of economical highway transportation. No system of railway branch lines could be created unless it were based upon main line railways connecting the larger centers. No railway system can furnish adequate service unless it is properly related to the deep water base.

We may be warned against too strict adherence to academic logic, but in view of the present confusion and chaos, a slight injection of logic and reason might not be the worst thing that could happen. Detached consideration of the broad view may point the way toward the solution, or at least toward the basis on which the solution may be worked out by practical method. Examination of the facts as they are today and as they have been for fifteen years, and as they have been indicated for a generation, compel one to the conclusion that the foundation of the transportation system of the United States must be set up in a structure symmetrical, standing upon the water base on all four sides.

VI

The sea base is and must be the foundation of the internal transportation system which, by rail, highway and inland waterway, each in its capacity, extends over the whole country. A balanced transportation structure is possible serving the whole country only where there is a symmetrical water base. Symmetry in the United States is given to us by the proportionate development of the gateways of the Atlantic seaboard, of the Gulf and of the Pacific slope, and the attainable development upon an ocean-going basis of the lakes ports.

The Great Lakes and the St. Lawrence together constitute an inland waterway and a frustrated seaway of enormous importance in its present utility, and of indispensable value in its potential development.

This waterway and seaway consists now of three parts. There is the highway of five Great Lakes, four originally separated by shallows but now connected by channels with minimum project depths of 21–22 feet. On the Great Lakes there is a commerce of more than one hundred twenty-five million tons a year. It is in great part the movement of Lake Superior ores to Lake Michigan and Lake Erie, of coal from Lake Erie to upper lakes ports, of grain and flour from the head of navigation toward the seaboard. The land-locked commerce of the lakes has reached these enormous proportions. The frustrated movement, through the smaller channels below Lake Erie, is of less volume and is confined to a relatively small range of commodity cargoes; mixed cargo movement, through this compound channel, because of the interrupted passage and perhaps for want of terminal facilities and traffic organization, is inconsiderable. At the other end, Montreal, one thousand miles from the ocean, approached from the St. Lawrence estuary by improved channels nearly two hundred miles above the natural head of deep water navigation, has become the second largest port on the North American Atlantic Coast.

The interrupted seaway between Montreal and the foot of Lake Erie is divided in two parts, Lake Ontario, separated from Lake Erie by the Niagara barrier, and the Upper St. Lawrence broken into a series of pools by the rapids. From Lake Erie to Lake Ontario and passing the rapids in Canada, is a series of canals having limiting depths of fourteen feet. These canals are reckoned as obsolete. Thirty years ago they would admit the standard carriers of the Great Lakes fleet, but the deepening of the upper lakes passages so greatly improved the economy of the carriers that the St. Lawrence canals were relegated to

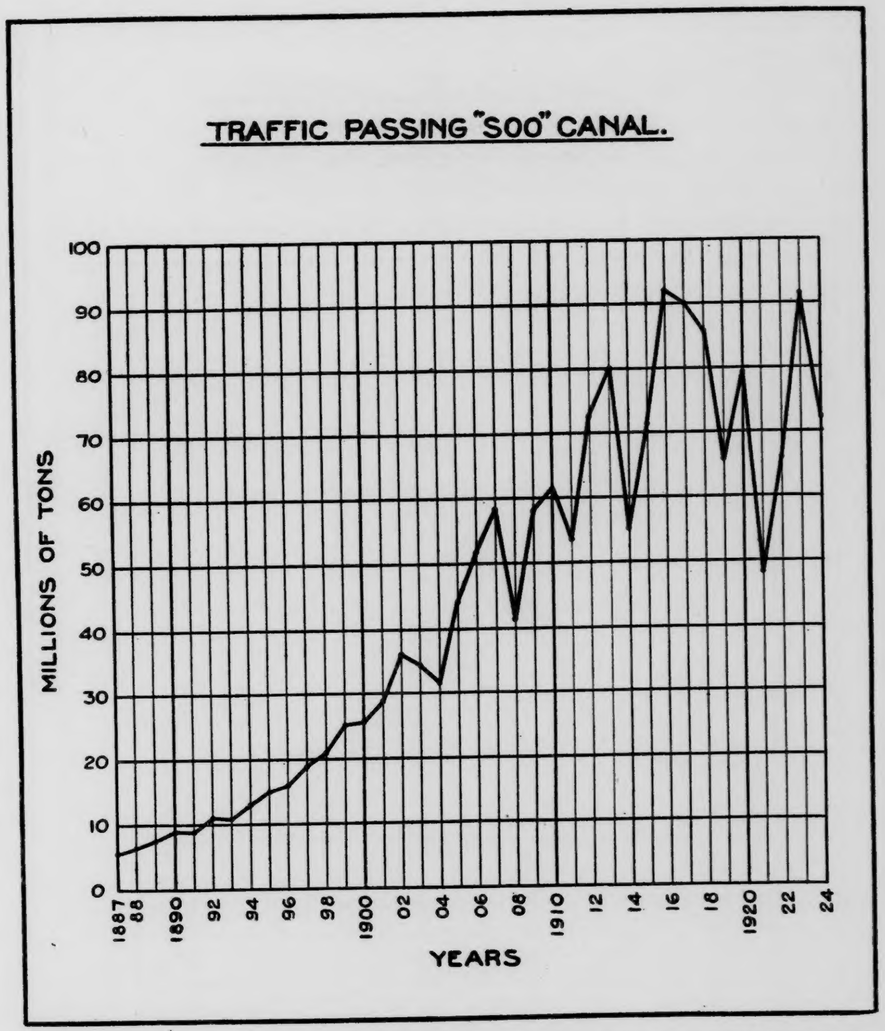
inferiority. They are also antiquated. Modern engineering, as exemplified by plans for the new Welland and for the new St. Lawrence, would not only deepen and broaden the channels, but reduce by half the number of locks and for a considerable distance, drowning out the rapids, would supplant the artificial channel with the free navigation of a broad, deep pool. Nevertheless, in spite of all these handicaps, the St. Lawrence section of the seaway through the Welland Canal, through the length of Lake Ontario, through the canals and pools of the St. Lawrence, now carries above five million tons a year of freight, a volume greater than that which moves through the magnificent system of state canals built by New York, greater than that of the Mississippi above New Orleans, larger, indeed, than both combined. Even as thus frustrated, there is a significant movement of ocean-going boats through the St. Lawrence canals, either bringing cargoes or put in commission to participate in the lakes trade.

For a considerable period during 1923 and 1924, the St. Lawrence route not only made the rate, but it controlled the flow of export grain from the Great Lakes. This benefit to the grain shippers was temporary. With the quickening of the movement in the fall the facilities became congested, rates advanced sharply and other lines were able to participate in the movement. The capacity of this route has already been reached, and relief can only be secured when the Great Lakes are open throughout the season to all sorts of merchantmen of the average carrying capacity of the world's fleet. Only then can the benefits of through water transportation be extended to the products of manufacture which do not constitute bulk cargoes and to which interruption of water carriage by repeated transfers is a complete barrier.

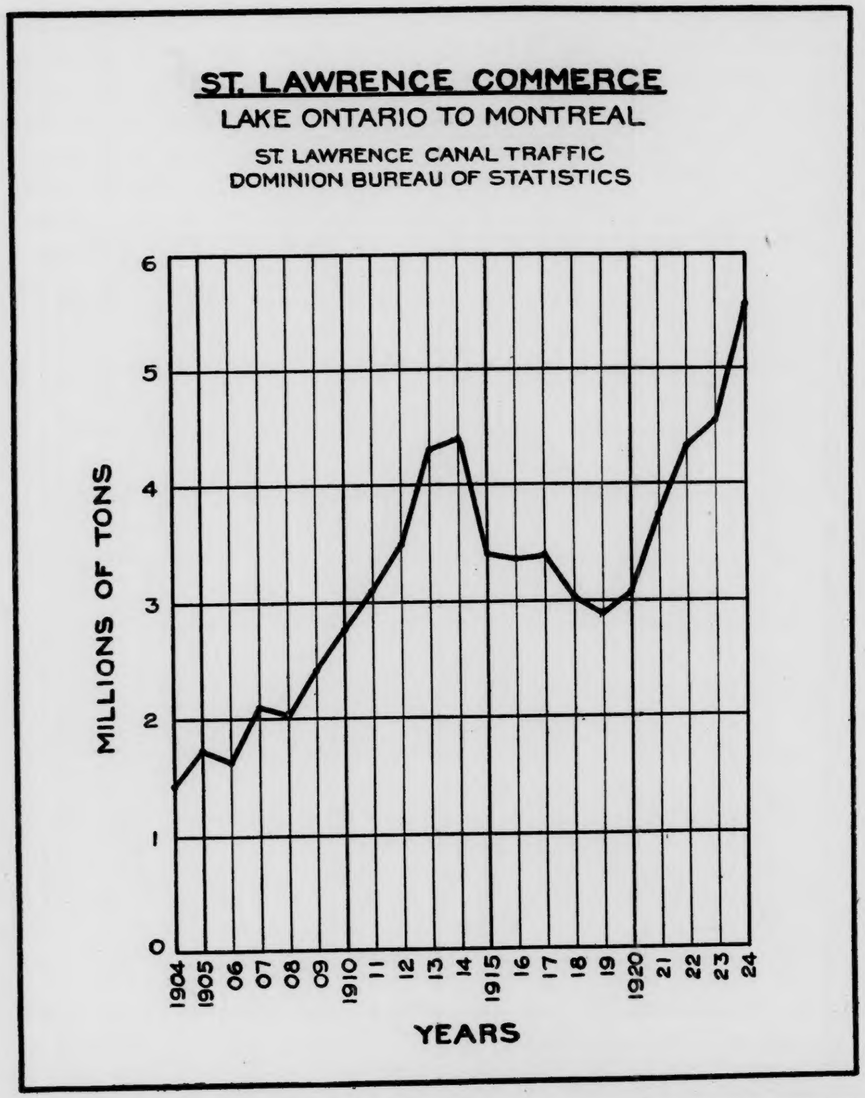
The recent coming into the lakes in ocean bottoms of steel, pulpwood, nitrates, clay, sugar, lumber, coffee and other cargoes, and the movement down the lakes of cargoes of wheat, flour, automobiles and supplies destined to foreign ports are highly significant of the pressure upon the transportation system, the eagerness to find new inlets and outlets, to redress the unsteady balance of costs and service in transportation. The real significance of the lakes to ocean seaway, as it exists, is that on the highway of the upper lakes there has been built up a landlocked commerce which is approached nowhere else in the world, that at the present head of ocean navigation sits a port claiming to be second only to one other on the North Atlantic seaboard and that through the least usable portion of this lakes-to-ocean route, through the antiquated channels of the partly improved section, there is carried a greater tonnage than that of the New York State Barge canal and of the Mississippi above New Orleans combined. The feasibility of the proposed improvement has been established beyond any question.

The estimates of cost which are verified within a reasonable margin of error are far below the ascertained benefits.

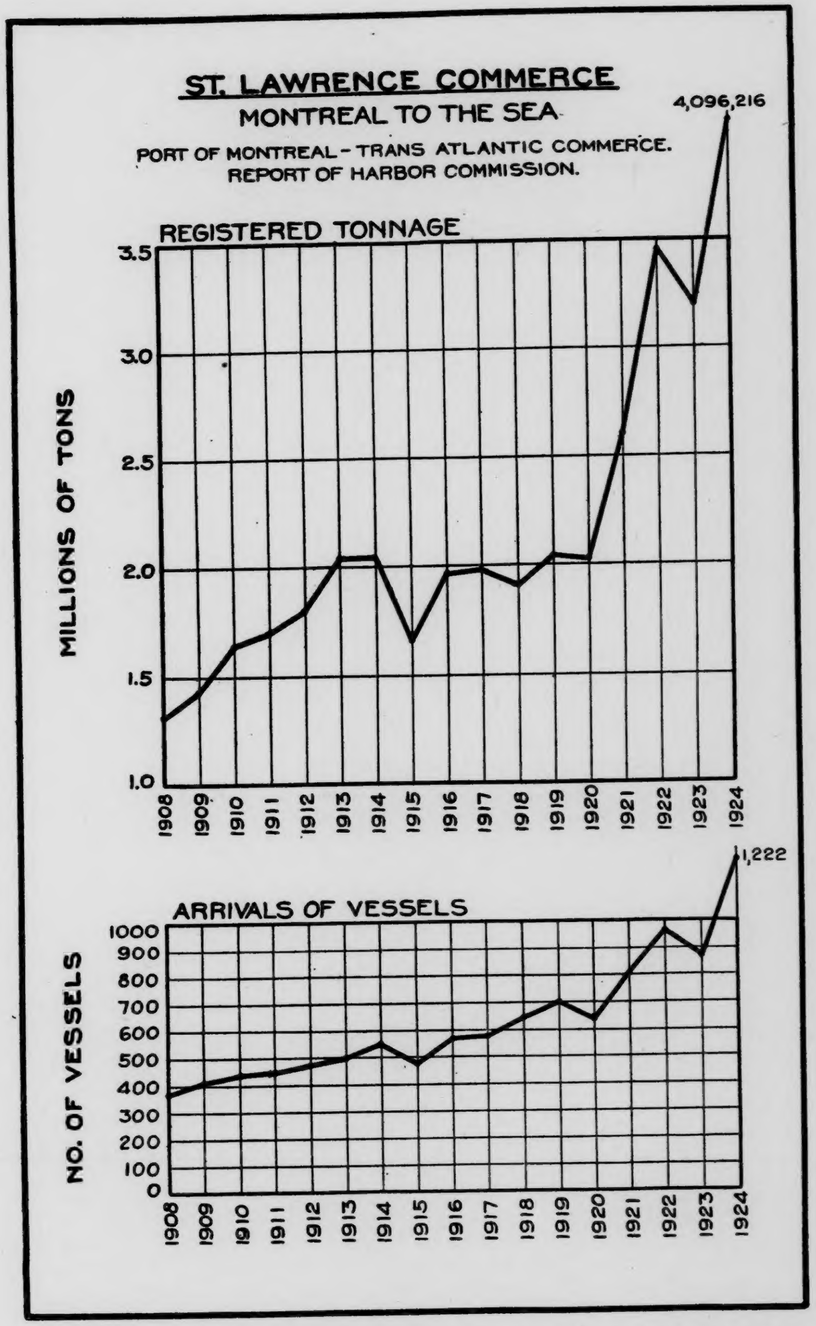
Above the localized benefits of actual return upon the investment is the immeasurable value of that improvement which will complete the symmetry of the sea base upon which may be erected, without any extensive reconstruction, a symmetrical system of internal transportation: symmetrical in its potential development of ports and outlets, symmetrical in the relatively even flow of commodities, symmetrical in the comparatively equable use and distribution of equipment, symmetrical in the generation of a rate structure which will afford a living return to the carrier, nourish its earning powers for extension and reproduction and encourage the energy of the producers for the largest possible increase of the country's resources.



On the Great Lakes the largest stream of traffic is that to and from Lake Superior, branching to Lake Michigan, chiefly ore; to Lake Huron, grain to Georgian Bay; to Lake Erie, ore, grain and coal returning. This is near two-thirds of total Great Lakes traffic. The stream between Lake Michigan and the lower lakes comes next. The rest is local traffic or cross lake traffic, with a relatively small amount of through traffic, without transfer, between upper lakes ports and "outside."



Measure of traffic passing 14-foot channels of the St. Lawrence canals. Figures for the Welland canal are not greatly different. In 1915 the St. Lawrence fleet was taken out to sea and the canals were stripped of floating equipment for use during the War; the boats have been coming back since the War.



The growth of transatlantic commerce to and from Montreal reflects not only the development of the interior but the successive improvements of the channel, permitting larger carriers.

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